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**APPLICATION
FOR
UNITED STATES
LETTERS PATENT**

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FOR: DATA COMMUNICATION SYSTEM,
AND SERVER AND CLIENT
COMPUTER CONSTRUCTING SAID
SYSTEM

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SPECIFICATION

TITLE OF THE INVENTION

DATA COMMUNICATION SYSTEM, AND SERVER AND CLIENT
COMPUTER CONSTRUCTING SAID SYSTEM

5 BACKGROUND OF THE INVENTION

Field of the Invention

 This invention relates to a system constructed by a
client computer and server capable of communicating data
with each other, the client computer and the server
10 constructing this system, a method of controlling the
server, and a recording medium storing a program for
controlling the client computer.

Description of the Related Art

 The building of networks has made it possible for a
15 document (which may include images) to be created while
a client computer and server communicate with each
other. In a case where the client computer creates a
document, fonts usable at the client computer are
employed. When the operator of the server creates a
20 document in accordance with a command from the user of
the client computer, fonts usable at the server are
employed.

 In many instances the fonts usable at the client
computer and the fonts usable at the server do not
25 match. As a consequence, there are cases where a
document created using a special font at the client
computer cannot be created using this font at the
server.

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DISCLOSURE OF THE INVENTION

An object of the present invention is to employ fonts usable at both a client computer and server in a case where a document is created while data
5 communication is performed between the client computer and the server.

A data communication system according to the present invention is constructed from a client computer and a server that are capable of communicating data with
10 each other.

The client computer has a first font transmitting unit (first font transmitting means) for transmitting font information data representing fonts capable of being output at the client computer.

15 The server has a first receiving unit (first receiving means) for receiving the font information data that has been transmitted from the first font transmitting unit of the client computer; a font search unit (font search means) for searching for fonts, which
20 are capable of being output at the client computer, from among fonts capable of being output at the server, on the basis of fonts represented by the font information data that has been received at the first receiving means; and a second font transmitting unit (second font
25 transmitting means) for transmitting font information data representing the fonts, which have been found by the font search unit, to the client computer.

The present invention provides also a method of

controlling the server. Specifically, the invention provides a method of controlling a server which communicates data with a client computer, the method comprising the steps of: receiving font information
5 data that has been transmitted from the client computer and that represents fonts capable of being output at the client computer; searching for fonts, which are capable of being output at the client computer, from among fonts capable of being output at the server, on the basis of
10 fonts represented by the font information data that has been received; and transmitting font information data representing the fonts that have been found to the client computer.

The present invention provides also a recording
15 medium storing a program for controlling the client computer.

In accordance with the present invention, the font information data representing fonts capable of being output at the client computer is transmitted to the
20 server.

The server receives the font information data and, on the basis of the fonts represented by this received font information data, searches for fonts capable of being output at the client computer among the fonts
25 capable of being output at the server. Accordingly, fonts capable of being output at both the client computer and server are found.

The font information data representing the found

fonts is transmitted from the server to the client computer.

By creating a document at the client computer using the fonts represented by the font information data that
5 has been received, it is possible to create a document having fonts capable of being output at both the client computer and server.

Data representing the created document is transmitted from the client computer to the server and
10 is printed by the server, by way of example. Since fonts capable of being output at both the client computer and server are being used, the fonts of the document output at the client computer and the fonts of the document output at the server are the same.

15 An arrangement may be adopted in which data representing the operating system of the client computer is transmitted to the server.

Even if the operating system of the client computer and the operating system of the server do not coincide,
20 fonts usable at the client computer can be detected at the server.

An arrangement may be adopted in which the server reports, in association with an operating system, fonts capable of being output.

25 Preferably, the client computer selects the type of document to be created and sends selection data, which represents the type of document selected, to the server.

In this case, the document selection data that has

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been transmitted from the client computer would be received at the server and the fonts capable of being output at the client computer would be searched for at the server based upon the type of document represented
5 by the received selection data and the fonts capable of being output at the client computer.

Thus, a document can be created using fonts suited to the type of document.

An arrangement may be adopted in which the server
10 reports, in association with the type of document, the fonts capable of being output.

Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying
15 drawings, in which like reference characters designate the same or similar parts throughout the figures thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates the overall configuration of an
20 image editing system according to a preferred embodiment of the present invention;

Fig. 2 is a block diagram illustrating the electrical construction of a client computer according to this embodiment;

25 Fig. 3 illustrates a menu file and font files that have been stored in a server according to this embodiment;

Fig. 4 is a flowchart illustrating processing

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executed by a client computer and by a server according to this embodiment;

Fig. 5 illustrates client information according to this embodiment;

5 Fig. 6 illustrates a font list according to this embodiment;

Figs. 7 and 8 illustrate examples of windows displayed on a display unit of a client computer according to this embodiment;

10 Fig. 9 illustrates an edit information file according to this embodiment;

Fig. 10 is a flowchart illustrating processing for creating a font list according to this embodiment; and

15 Figs. 11 to 14 illustrate examples of windows displayed on a display unit of the server according to this embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will now be described with reference to the drawings.

20 Fig. 1 illustrates the overall configuration of an image editing system according to an embodiment of the present invention.

As shown in Fig. 1, the image editing system is constructed by connecting a client computer 1 and a
25 server 30 via the Internet. Though a number of the client computers 1 are connected to the server 30, only one is illustrated in Fig. 1.

A high-quality printer 31 capable of printing high-

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[illegible]

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[illegible][illegible][illegible][illegible]

converter 13, whereby the image data is converted to an analog video signal so that an image is displayed on the display unit 14.

A bus controller 5, memory controller 15 and timer 16 are connected to the client computer 1.

Furthermore, a system input/output controller 6 is connected to the client computer 1. Connected to the system I/O controller 6 are a keyboard 7 and mouse 8 for accepting operating commands from the user of the client computer 1, a CD-ROM (compact disk read-only memory) drive 9 and FD (floppy disk) drive 10 for reading image data and programs, etc., and a modem 11 for providing a connection to the Internet.

An external I/O controller 18 is connected to the client computer 1, and an HD (hard disk) drive 21 is connected to the external I/O controller 18. Write and read-out of data to and from an HD can be controlled by the HD drive 21. A program that has been stored on a CD-ROM is written to the HD. By reading out an execution program that has been written to the HD, predetermined processing (described later) can be executed by the client computer 1.

A printer 20 for printing an image and a printer control circuit 19 for controlling the printer 20 are connected to the client computer 1.

The server 30 also has a construction almost the same as that of the client computer 1 though it goes without saying that the server 30 generally has a

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performance that surpasses that of the client computer 1, such as a high-quality printer 31 connected thereto. Further, it goes without saying that by inserting a CD-ROM storing a program into the server 30, the program is
5 read and the server 30 operates in accordance with the program.

Fig. 3 illustrates an example of files that have been stored on the hard disk of the server 30.

A menu file, a plurality of font files (Font Files
10 0, 1, 2 and 3) and other necessary files such as image files have been stored in the server 30.

Data representing all fonts that can be used at the server 30 has been stored in Font File 0 on a per-OS basis.

15 From among all fonts that can be used at the server 30, data representing fonts suited to services has been stored in the Font Files 1 to 3 on a per-service basis. From among all fonts that can be used at the server 30, data representing fonts preferred for use when a
20 postcard is created has been stored in Font File 1 on a per-OS basis. From among all fonts that can be used at the server 30, data representing fonts preferred for use when a business card is created has been stored in Font File 2 on a per-OS basis. From among all fonts that can
25 be used at the server 30, data representing fonts preferred for use when a poster is created has been stored in Font File 3 on a per-OS basis.

The menu file contains data indicating in which of

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the Font Files 1 to 3 a font suited to a service has been stored.

Fig. 4 is a flowchart illustrating processing illustrated between the client computer 1 and server 30.

5 The Web home page of an image editing service provided by the server 30 is accessed by the user of the client computer 1 (step 41).

When the client computer 1 and the server 30 are connected, home-page data for service selection is
10 transmitted from the server 30 to the client computer 1 in response to a request from the client computer 1 (step 51).

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The home-page data for service selection transmitted from the server 30 is received by the client
15 computer 1, whereupon the home page for service selection represented by the home-page data for service selection is displayed on the display screen of the display unit 14 of client computer 1 (step 42). The service utilized is selected by the user of the client
20 computer 1. Here the user selects any service from among a "POSTCARD EDITING SERVICE", "BUSINESS CARD EDITING SERVICE" and "POSTER EDITING SERVICE" (step 43).

If the user selects a service, data indicative of the selected service and client information are
25 transmitted to the server 30 (step 44).

Fig. 5 illustrates the client information.

The client information includes OS information indicative of the OS of client computer 1, and font

information indicative of fonts usable at the client computer 1.

With reference again to Fig. 4, the selected service and client information transmitted from the client computer 1 are received by the server 30. The latter executes processing for creating a font list (see Fig. 6) indicating the fonts that can be utilized in image editing processing at the client computer 1 (step 52). The processing for creating this font list will be described later in detail. The data representing the font list created by the font list creation processing and data representing the editing home page for carrying out the service selected by the user of the client computer 1 is transmitted from the server 30 to the client computer 1 (step 53).

When the editing home-page data and font-list data transmitted from the server 30 is received by the client computer 1, the editing home page is displayed on the display screen of the display unit 14 of client computer 1 (step 45).

Fig. 7 illustrates an example of the editing home page.

Here it is assumed that the user of the client computer 1 has selected the "POSTCARD EDITING SERVICE". Naturally, when the user of the client computer 1 selects another service, an editing home page corresponding to the selected service is displayed.

The editing home page includes the following areas:

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- 06-197-081-00**

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[illegible]

- 06-197-081-00**

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Enlarge/reduce area 64

This is an area clicked by the user when a user image is enlarged or reduced in size.

Rotate area 65

- 5 This is an area clicked by the user when a user image is to be rotated.

The user utilizes the editing home page to combine a desired user image with a template to perform image editing. When an image is combined with a template,
10 "SALUTATION" in area 61 is clicked by the user. When this is done, a salutation input dialog box shown in Fig. 8 appears on the display screen of the display unit 14 of client computer 1.

- 15 The salutation input dialog box includes the following areas:

Salutation text display area 71

This is an area in which text entered by the user is displayed.

Font name display area 72

- 20 This is an area for displaying a user-selected font from among the fonts contained in the font list that has been transmitted from the server 30.

Vertical/horizontal writing designation area 73

- 25 This is an area for designating whether entered text is to be written vertically or horizontally.

Size designation area 74

This is an area for designating the size of entered text.

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Italic designation area 75

This is an area checked by the user when entered text is to be italicized.

Underline designation area 76

5 This is an area checked by the user when entered text is to be underlined.

Color-change designation area 77

This is an area clicked by the user when the color of entered text is to be changed.

10 Shadowing designation area 78

This is an area checked by the user when entered text is to be shadowed.

Shadowing color-change designation area 79

15 This is an area checked by the user when the color of shadowing of entered text is to be changed.

OK area 80

This is an area clicked by the user when entered text is to be inserted as a salutation.

Cancel area 81

20 This is an area clicked by the user when entered information such as a salutation is to be canceled.

If text is entered by the user and the user clicks the OK area 80, the dialog box for input of the salutation vanishes. The text that has been entered is
25 inserted into the edited image (which is displayed in the editing image display area 63) at the prescribed location thereof.

Fig. 9 illustrates an edit information file

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generated in response to editing of an image by the user.

The edit information file includes template information, combined-image information and text
5 information.

The template information is information regarding the template that constitutes the edited image and includes base-image information and mask-image information.

10 The base-image information is information regarding the background image of the template image and contains data representing category, image storage location and aspect ratio.

The mask-image information is information which
15 stipulates an area in the template image for combining the user image and contains data representing category, image storage location and aspect ratio.

The combined-image information contains the user-image information, combining-position information and
20 clip-art information.

The user-image information is information regarding the user image to be combined with the template and contains a category, image-storage location and degree of rotation.

25 The combining-position information is information indicating the position at which the user image is to be combined and contains X and Y coordinates representing the starting point for painting of the user image, as

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well as paint height and width of the user image.

The clip-art information is information regarding clip art inserted into the edited image and contains X and Y coordinates representing the starting point for painting of the clip-art image, as well as paint height and width of the clip-art image.

The text information includes combining-position information, style information and text content.

The combining-position information contains X and Y coordinates representing the starting point for painting of text, as well as paint height and width of the text.

The style information contains information entered by the salutation input dialog box, such as the font name, font size, text color, whether italic characters are to be used and whether underlining is to be performed, as selected by the user.

The content of text contains the text that has been entered by the salutation input dialog box.

Thus, by editing an image on the editing home page, such an edit information file is generated.

With reference again to Fig. 4, the "ORDER" area in the creation menu area on the editing home page is clicked by the user if image editing processing has been completed (step 46). This acts as a print request (step 47). The user image used in the image edited by the user and the edit information file that has been created are transmitted from the client computer 1 to the server 30.

The edited image that has been printed is delivered
15 as by mail to the residence of the user of client
computer 1.

20 When data representing a service and client
information transmitted from the client computer 1 are
received by the server 30 (step 91), reference is had to
the menu file of the server 30 and a search is conducted
for the font file corresponding to the service that has
25 been selected by the user of the client computer 1 (step
92). For example, if the service that has been selected
by the user is the "POSTCARD CREATION" service, then
Font File 1 is found.

When the font file corresponding to the service is found, then this font file is searched for the font names grouped under an OS identical with the OS representing the OS information contained in the client
5 information (step 93). If the OS information indicates OS 1, then the font file is searched for "MS GOTHIC, MS MINCHO, DFP SEMICURSIVE, DFP BLOCK MEDIUM" grouped under OS 1.

Furthermore, the font names found are searched for
10 fonts that are the same as those represented by the font information that has been transmitted from the client computer 1 (step 94). For example, if the font information that has been transmitted from the client computer 1 is as shown in Fig. 5, then "MS GOTHIC, MS
15 MINCHO and DFP SEMICURSIVE" are eventually found.

The fonts thus found constitute the font list, which is then transmitted from the server 30 to the client computer 1.

Figs. 11 to 14 illustrate examples of windows
20 displayed on the display unit of the server 30. These windows will be referred to in order to describe processing for registering fonts with the server 30.

When a font registration mode is established, a font registration window illustrated in Fig. 11 appears
25 on the display unit of the server 30.

The font registration window includes the following areas:

Compatible OS setting area 101

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This is an area in which an OS compatible with the registered fonts is selected by a check box B1.

Service setting area 102

This is an area in which a service suited to use of
5 the registered fonts is set by a check box B2.

Font view area 103

By clicking this area after an OS and service have been selected, a font viewing window shown in Fig. 12 appears.

10 New-font view area 104

By clicking this area, a new-font list window shown in Fig. 14 appears.

End area 105

This is an area clicked by the user when font
15 registration processing is to be exited.

As shown in Fig. 12, the fonts that can be utilized by the OS and service that have been set in the font registration window are displayed in list form in the font viewing window in an area 106 for each sample name
20 and font sample. Further, check boxes B3 also are displayed in association with the names of the fonts. It goes without saying that the menu file and font files already stored in the server 30 are utilized.

The font viewing window includes an add area 107, a
25 delete area 108 and a back area 109. If the add area 107 is clicked, a font addition window shown in Fig. 13 is displayed on the display unit. If the delete area 108 is clicked, this causes deletion of the font whose

check box B3 included in area 106 has been checked. As a result, this font is deleted from the corresponding font file. If the back area 109 is clicked, the font registration window shown in Fig. 11 is displayed.

5 As shown in Fig. 13, the names of fonts not utilized by the OS and service that have been set in the font registration window are displayed in the form of a list in an area 100 thereof in the font addition window. These fonts are among those stored in the server 30.

10 This list of fonts can be created using Font File 0 and Font Files 1 to 3. When addition is to be performed, a check box B4 corresponding to the font name to be added is checked.

15 The font addition window further includes an add area 111 and the back area 109. Clicking the add area 111 causes the font name whose check box B4 has been checked to be stored in the font file of the corresponding service as a font suited to the OS and service that have been set. If the back area 109 is
20 checked, the font viewing window shown in Fig. 12 is displayed.

25 As shown in Fig. 14, fonts that have not been registered for services are displayed in a new-font viewing window in a display area 113 thereof in the form of a list. The new-font viewing window includes an update area 112 and the back area 109.

Clicking the update area 112 causes the font files to be reconstituted in such a manner that the fonts of

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font names whose check boxes B5 have been checked will be utilized in the particular service. The font registration window is returned to by clicking the back area 109.

- 5 As many apparently widely different embodiments of the present invention can be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended
- 10 claims.

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